BY ORDER OF THE COMMANDER
AIR FORCE MATERIEL COMMAND

AFMC INSTRUCTION 21-127

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Maintenance

DEPOT MAINTENANCE PLANT MANAGEMENT (CORRECTED COPY)

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements applicable provisions of AFPD 21-1, *Managing Aerospace Equipment Maintenance*, AFI 21-102, *Depot Maintenance Management*, AFI 32-1031, *Operations Management*, AFI 23-111, *Management of Government Property in Possession of the Air Force*, AFI 21-113, *Air Force Metrology and Calibration Program*, AFI 24-301, *Vehicle Operations*, TO 00-20-5, *Aerospace Vehicle/Equipment Inspection and Documentation*, and T.O. 00-20-14, *Air Force Metrology and Calibration Program.* It provides policy, procedures and responsibilities for the Plant Management Divisions at the Air Logistics Centers (ALC) and the Aerospace Maintenance Regeneration Center (AMARC) as applicable. This instruction does not apply to the Air National Guard or US Air Force Reserve Command units and members. When developing local procedures, bargaining obligations must be met with the respective local union.

SUMMARY OF REVISIONS

This is a complete rewrite of this instruction.

Chapter 1

GENERAL

1.1. Purpose. This instruction provides guidance, procedures and responsibilities for the Depot Maintenance Plant Management Divisions and the organizations they support. The Plant Management function includes industrial plant equipment (IPE) and facilities maintenance, installation, engineering, precision measurement equipment maintenance (PME), and services and management support.

1.2. Mission Functions. The mission of the Plant Management Division (TIP) is to:

1.2.1. Install, relocate, modify or remove nonreal property facilities and equipment.

1.2.2. Perform nonreal property facility maintenance and equipment preventive and predictive maintenance.

1.2.3. Repair nonreal property facilities and equipment.

1.2.4. Receive work requests, engineer and plan, schedule and control, and manage material support related to 1.2.1 through 1.2.3.

1.2.5. Manage and operate the industrial tool management center (TMC).

1.2.6. Assist the base civil engineering (BCE) in the development and management of depot maintenance activity group (DMAG) facility maintenance, repair, and minor construction programs.

1.2.7. Manage the DMAG service contract program.

1.2.8. Provide a focal point for requesting and monitoring BCE support of industrial real property facilities and equipment.

1.2.9. Provide nonreal property engineering support to product directorate functions.

1.2.10. The following functions may be performed by the Plant Management Division:

1.2.10.1. Manage Technology and Industrial Support Directorate transportation and material handling vehicles

1.2.10.2. Manage industrial product directorates' energy conservation program.

1.2.10.3. Manage programs for collecting, reclaiming, and disposing of scrap material, except precious metal.

1.2.10.4. Manage Technology and Industrial Support Directorate safety and environmental programs.

1.2.10.5. Manage and operate the Precision Measurement Equipment Laboratory (PMEL).

1.2.10.6. Manage other DMAG workloads as determined appropriate by the individual ALC.

1.3. Operating Instructions. Each ALC will develop local procedures that will, as a minimum, meet the requirements of this instruction. (**NOTE:** Local directives will be developed or updated for implementation within 180 days from the publication of this instruction). Operating instructions will provide specific procedures for the following:

1.3.1. Processing, controlling, and accomplishing requests for plant management support of depot maintenance equipment and facilities.

1.3.2. Determining requirements, monitoring, and accomplishing preventive and predictive maintenance for depot equipment.

1.3.3. Developing plans and performing plant management functions.

1.3.4. Controlling materials, tools, and designated vehicles.

1.4. Categories of Plant Management Work. Work performed by the Plant Management Division falls into the following general categories:

1.4.1. Repair. Work normally generated on an unscheduled basis from utility, facility, or equipment failures. The Plant Management Division (TIP) will operate a trouble call desk for the receipt and processing of emergency repair work on nonreal property. All repairs involving real property should be referred directly to the BCE service desk by authorized personnel. At the discretion of the ALC, the TIP and BCE trouble call desks may be combined. Instructions on repair work are included in chapter 2.

1.4.2. Project Work. Work resulting from management planning efforts. Examples of typical project-type workloads include the installation of new equipment and relocation of a production shop. The planning, scheduling, and control functions will receive and process requests for this type work according to chapter 3.

1.4.3. Preventive and Predictive Maintenance. Work planned and performed to protect the capability of equipment by removing the cause of failure and making adjustments for normal wear before failure occurs. This work is performed on a predetermined time schedule according to the instructions contained in chapter 2.

1.4.4. Direct Product. Work normally resulting from a requirement of a product directorate for skills peculiar to the Plant Management Division. When this occurs, procedures applicable to the direct production activity will apply to the plant management resources involved. A direct production resource control center (RCC) may be established in the Plant Management Division where it permits the most efficient use of skills and directorate resources.

1.5. Relationship to BCE (Work Accomplishment). See Figure 1.1. for a guide for Plant Management versus BCE responsibilities. Availability of resources may drive changes to BCE and Plant Management responsibilities listed in Figure 1-1. A local memorandum of agreement will be developed to reflect these changes.

1.5.1. BCE's Mission and Function Statement. BCE is responsible for maintaining real property, roads and grounds, real property installed equipment (RPIE), and utilities. Real property facilities and equipment are defined as lands, buildings, structures, utility systems, improvements and accessories as accounted for in real property records. The BCE obtains project approval, executes facility projects, establishes and maintains programs to prevent real property deterioration, develops and conducts a facilities and infrastructure maintenance and operations program based on mission requirements and cost effectiveness.

1.5.2. Plant Management Division's Mission and Function Statement. See paragraph 1.2.

1.6. Requests for BCE Support. The Plant Management Division reviews and processes AF Forms 332, **Base Civil Engineer Work Request**, to the BCE. Emergency calls can be processed by the real property custodian. The Plant Management Engineering Section will serve as liaison between the product directorates and the BCE to resolve support problems.

1.7. Acquisition of Plant Management Equipment. Table of Allowance 576 prescribes allowances for equipment required by the Plant Management Division to maintain the industrial plant equipment (IPE) complex.

Figure 1.1. Plant Management Versus BCE Responsibilities.

TASK	TIP	BCE
1. Equipment Repair and Maintenance	X	X
a. Real Property Installed Equipment (RPIE)		
b. Industrial Plant Equipment (IPE)	X	
2. Equipment Installation:	C	
a. Installation/Relocation of Prefabrication Screens, Partitions, and Dividers	C*	
b. False Floors and Platforms	C*	
c. Excavation	C*	
d. Anchorage to Floors	C	
e. Foundation and Pads	C	
f. Temporary Removal and Reinstallation of Existing Roofs, Walls, Utility Systems and Appurtenances		
g. Ventilation and Separate Exhaust System Requiring Wall or Roof Penetration	X	
h. Utilities:		
(1) Electrical less than 600 volts, from the equipment to first service disconnect	X	X
(2) Electrical greater than 600 volts all connections		
(3) Other utilities, e.g., compressed air, chilled water, steam, potable water, natural gas, from the equipment to first connection providing the source of supply	X	
(4) Industrial gases, e.g., argon, hydrogen, nitrogen, all government-furnished pipe, valves, fittings, gauges, etc.	X	
(a) Air-conditioning strictly for equipment operation		X
3. Real Property Facilities and Installed Equipment Repair and Maintenance	X	
4. Portable Buildings:		
a. Repair and Maintenance		X
b. Siting and Utility Connections	X	
5. Painting:		
a. Industrial Plant Equipment (IPE)		X
b. Real Property Facilities and Equipment		
	X	X
a. Utility Plants, Systems, Components and Cathodic Protection	X	X
b. Equipment Utility Connections		
7. Pavement Construction, Repair and Maintenance	X	
8. Sign Construction, Modification, and Replacement:		
a. Facility and Exterior Organizational Identification		X
b. Interior Organizational Signs		X
9. Duplicate Keys:	X	
a. Real Property Facilities Integral Type Locks		
b. Padlocks and Organizations Equipment		X
10. Grounds Keeping (Mowing and Policing)		X
a. Within 50 feet for assigned facilities, or as designated locally		
b. Other		
11. Landscaping (Planting, Spraying, and Fertilizing)		
12. Interior Lighting:		
a. Up to 10 feet in height		
b. From 10 feet and above		
13. Exterior Lighting		

NOTES:

X indicates office of primary responsibility (OPR).

C indicates OPR, but BCE coordination/support required prior to Plant Management performing work. Local coordination procedures will be jointly determined by Plant Management BCE. The OPR for C* tasks may vary based on the extent and/or nature of the work. These areas are negotiated if the OPR is not clear. This listing of TIP responsibilities versus BCE responsibilities was modified to require additional coordination. This increased coordination will protect utility systems from overload and help to maintain the structural integrity of real property.

Interpretation of Utility Tasks:

Electrical, less than 600 volts. TIP will maintain all branch circuits within a product directorate occupied facility from power distribution panel or busway to non-RPIE utilization equipment. BCE will be responsible for power supply and electrical components to the branch circuit service equipment of non-RPIE and power supply and all electrical installations to RPIE. BCE will make all connections to the supply point in electrical vaults for RPIE and non-RPIE, unless approval is granted to TIP through an AF Form 332.

Electrical, greater than 600 volts. BCE will be responsible for maintenance and repair of all power supply, electrical equipment and connections to RPIE as well as non-RPIE.

Potable Water Systems. BCE will be responsible for maintenance and repair of the systems to be used for personnel and sanitary installations as well as the supply and complete distribution system up to and including the backflow preventing device at the service connection to all process and non-RPIE industrial systems. (Fire water supply and distribution systems are BCE responsibility.)

Chilled Water and Hot Water Systems. Chilled water and hot water systems are considered utility systems if any part of either system is being utilized for “creature comfort” or other RPIE support. As a utility, BCE will be responsible to maintain the chilled water plant or boiler plant supply and return piping main loop as well as all RPIE support secondary distribution systems. Process and other non-RPIE hot or chilled water supply and return pipe systems will be maintained by the TIP from the service connection at the supply main to the service connection at the return main or first valve installation in service loop if no disconnecting means is available at the service connection.

Steam and Condensate Return, Natural Gas, and Compressed Air . All plant and main distribution systems are the responsibility of the BCE. Secondary branch systems to support non-RPIE will be maintained by TIP from the service connection at the main distribution system (or closest valve in the branch line if no service disconnect is available) to the non-RPIE or utilization process. BCE will make all connections to the source of supply.

Industrial Gases (argon, hydrogen, nitrogen, etc.) and high compressed air. All plants, storage reservoirs, pipe systems, gauges, etc. will be maintained by TIP.

Waste Water Collection Systems. BCE will be responsible for all collection systems supporting sanitary or personnel comfort facilities as well as RPIE producing waste water from point source to disposal plant. Waste water from non-RPIE or industrial process discharge sources will be conveyed by process piping or other means to the BCE industrial waste collection system. TIP will be responsible to maintain the non-RPIE waste water conveying systems from its source to the nearest floor drain, sump or lift station wet well. These latter locations are collection points for the BCE industrial sewage systems. Below grade sumps that have no gravity drain connection to the industrial waste system and collect waste water from non-RPIE sources only will be considered the same as floor drains and will be maintained by the BCE. Small waste water forwarding pumps (1 horsepower or less) complete with discharge piping, valves, fittings and controls as required to service these small pumps will consequently be included as a part of the conveyance system and will be TIP responsibility. BCE will be informed by TIP anytime a change in production processes will result in increased volume of waste collection.

Storm Water Collection System. Maintenance of storm drains is a BCE responsibility. No other than nonpolluted run off flows from rain water shall be conveyed to the storm water collection system.

Irrigation Sprinkler Systems. Maintenance and repair of automatically or manually controlled irrigation and sprinkler systems is a BCE responsibility and as RPIE will be a part of landscaping.

Newly-Constructed Facilities and Substantial Additions or Alterations to Existing Facilities. TIP will be notified when BCE has accepted the formal issuance of a certification of beneficial occupancy. Prior to occupying a new facility, TIP and BCE will meet to confirm all BCE responsible equipment and TIP responsible equipment. When responsibility is determined, TIP and BCE will install a tag on their identified equipment to indicate recognition of their maintenance responsibility. BCE will turn over to the TIP representative all operator maintenance (OM) manuals, spare parts lists, drawings, start-up instruction, etc., for industrial equipment which are provided by the contractor as a requirement of the construction contract. To assure that warranty conditions are properly satisfied, it is imperative that BCE promptly surrenders all non-RPIE PM and OM data to TIP and timely arranges for the preoccupation meeting with TIP representatives.

Chapter 2

MAINTENANCE ELEMENTS

2.1. Maintenance Planning Elements.

2.1.1. Priorities of Maintenance: Maintenance is either emergency or routine, based on the urgency, as follows:

2.1.1.1. Emergency Maintenance. Repair work demanding an immediate response to prevent injury to personnel, damage to government property, or shutdown of vital production facilities and equipment.

2.1.1.2. Routine Maintenance. Work of a non-critical nature that can be deferred pending the normal planning and scheduling process.

2.1.2. Planning. The primary difference between repair work planning and preventive maintenance (PM) and project work is the short time-span that exists when identifying a repair requirement and the need for accomplishing the repair. For emergency repair work, planning consists of having the required resources available based upon past experience. If resources are not available to do the work, it is often necessary to accelerate planning.

2.1.3. Scheduling and Control. To hasten response to repair work, the trouble call desk (operated by the Plant Management Division (TIP) or Base Civil Engineering (BCE) or combined) will receive emergency requests and relay the work requirements to the maintenance function.

2.1.4. Material Control. Timely response to emergency requests dictates that repair material be available from bench stock or material inventory control for immediate use when practical. Many repair parts will not be required frequently enough to be stocked under normal bench stock criteria. However, to preclude work stoppage situations, special levels should be established for long lead-time parts with low demand rates for critical, one-of-a-kind equipment. Spare parts lay-in for new equipment should be based on recommendations of the manufacturer and experience with similar equipment. (**Note:** Terminology used for these areas may differ somewhat from center to center).

2.1.5. Maintenance Initiation.

2.1.5.1. The requesting organization documents the discrepancy by annotating the AFTO Form 244/245, **Industrial/Support Equipment Record**, or a computer generated equivalent, and initiates a request for repair by telephone to the trouble call desk with the following information:

2.1.5.1.1. Type or nature of repair service required.

2.1.5.1.2. Type of equipment and the equipment identification number.

2.1.5.1.3. Urgency of repair (justification to establish priority).

2.1.5.1.4. If priority Code 4 or Code 5, as validated by the Trouble Call Desk, the name of the individual justifying urgency.

2.1.5.1.5. Equipment location including building number, post or room number, shop name, etc.

2.1.5.1.6. Name and telephone number of person and alternate to be contacted at repair site.

2.1.6. Trouble Call Desk Responsibilities.

2.1.6.1. Receives calls and determines applicable repair shop.

2.1.6.2. Prepares Service Order or Work Authorization Document (WAD) by entering the data into the maintenance documentation computer system.

2.1.6.3. Establishes priority according to the following:

2.1.6.3.1. Condition Code 5 -- Extreme safety hazard to personnel.

2.1.6.3.2. Condition Code 4 -- Actual work stoppage critical workload.

2.1.6.3.3. Condition Code 3 -- Actual work stoppage non-critical workload.

2.1.6.3.4. Condition Code 2 -- High potential for minor property damage.

2.1.6.3.5. Condition Code 1 -- Work that can be deferred.

2.1.6.3.6. Transmits Service Order or WAD to the maintenance function.

2.1.7. Maintenance Process.

2.1.7.1. The maintenance function receives the service order or WAD and dispatches repair technicians to the job site commensurate with the priority, skills required, and personnel available.

2.1.7.2. The repair technician verifies the equipment identification number prior to commencing repair action. The technician determines the job requirements and makes the repair. If repair work is beyond the scope or capability of the maintenance function, the technician should notify the appropriate supervisor who will prepare documentation to obtain contractor support.

2.1.7.3. If necessary material is available, the maintenance function and material control function will take action as follows:

2.1.7.3.1. Withdraws and receipts for needed material or parts from bench stock or warehouse.

2.1.7.3.2. Provides repair work order number to material control personnel.

2.1.7.3.3. Make repairs as required.

2.1.7.3.4. Obtains approval of the requester or alternate to indicate completion and acceptance of the work. The repair technician will sign off the AFTO Form 244/245 or computer generated equivalent to verify corrective action has been accomplished.

2.1.7.3.5. The maintenance function enters work hours and repair work resolution into the maintenance documentation computer system.

2.1.7.4. If necessary material is not available from bench stock or warehouse, the maintenance shop and material control functions will take the following actions:

2.1.7.4.1. The maintenance shop function identifies the material required to the material control function.

2.1.7.4.2. The material control function will accomplish necessary material research and order parts according to emergency requisition procedures.

2.1.7.4.3. The scheduling function (if required):

2.1.7.4.3.1. Schedules the work for accomplishment, forwarding a copy of the service order or WAD to the perfrming shop.

2.1.7.4.3.2. Places the repair service order or WAD file in suspense pending completion.

2.1.7.4.4. The maintenance shop function then:

2.1.7.4.4.1. Receives material and parts for the work order and makes repairs as required.

2.1.7.4.4.2. Obtains the approval of the requester or alternate to indicate completion and acceptance of the work.

2.1.7.4.4.3. The repair technician signs off the AFTO Form 244/245 or a computer generated equivalent to verify corrective action has been accomplished.

2.1.7.4.4.4. The maintenance function enters the work hours and repair work resolution into the maintenance documentation computer system.

2.2. Preventive Maintenance (PM). PM is the normal upkeep and preservation of equipment through systematic inspection, detection and correction of discrepancies to prevent failures, and verification of serviceability or restoring complete-serviceability to equipment that has been subjected to usage or deterioration from environmental elements. It is designed to protect the equipment capability and investment by removing the causes of failure and making adjustments to compensate for normal wear before failure or an unsafe condition occurs.

2.2.1. Basics. PM consists of equipment maintenance actions performed on a periodic basis, according to a specific set of instructions and a predetermined time schedule. It is performed by various personnel on a predetermined schedule and includes such actions as locating and correcting minor vibrations or tool chatter; making adjustments in gibs, bearings, lead screws, and leveling of machines; recognizing and identifying potential malfunctions by using one's perceptive sense or the aid of electronic devices, such as a vibration analyzer; checking electronic and electrical circuits and components for abnormal conditions (dirty contacts, loose connections, faulty grounds); adjusting or replacing drive belts and accomplishing lubrication requirements.

2.2.2. PM Frequency. PM inspections should be spaced as far apart as possible to reduce cost, yet, stay within safe time limits during which defects do not ordinarily develop to the point of needing attention. Use the following sources to establish PM frequencies:

2.2.2.1. Technical Orders. When an item of weapon peculiar equipment is covered by a TO, follow the prescribed frequencies, unless written authority to adjust the requirement is obtained.

2.2.2.2. Manufacturer's Recommendations. These normally assume a high degree of use; that is, eight or more hours per workday. Estimated usage rates will be used to compensate for the less than high use rates to preclude unnecessary PM costs.

2.2.2.3. Judgment. In the absence of other sources, judgment based on similar pieces of equipment may be applied.

2.2.2.4. Historical Data. Historical maintenance data may indicate the need to adjust PM frequencies. If frequent repair is required, increased PM may be justified. Conversely, lack of repair may indicate the PM frequencies should be reduced. Repair data is maintained on the AFMC Form 388, Machine Tool and Equipment Historical Record, or in the maintenance documentation computer system.

2.2.3. PM Instructions.

2.2.3.1. The Plant Management Division equipment specialists prepare PM instructions. The PM function will attach the AFMC Form 306, **Preventive Maintenance Instruction**, or a computer generated equivalent to the equipment. It is permissible to maintain this documentation in a readily accessible reference book in the vicinity of the equipment. Local instructions may re-designate this responsibility and documentation method. If an equivalent documentation method is used, it will include as a minimum, the nomenclature of the equipment, equipment identification number, frequency of maintenance action, and the actions required. If the maintenance documentation computer system is utilized, the Plant Management Division equipment specialist will enter the PM instructions and appropriate equipment data into it.

2.2.3.1.1. When PM accomplishment is shared between the PM function and the owning organization, such as specific operator maintenance, the documentation will clearly identify the separation of responsibility.

2.2.4. Establishing PM. PM is a shared responsibility as identified below, under maintenance program determination. The Product Directorate will ensure the Plant Management Division PM equipment specialists are notified of actions concerning new, relocated, and turned-in equipment and provided technical data on AFMC Forms 388 or local equivalent on all newly acquired equipment. Plant Management Division personnel will:

2.2.4.1. Establish a suspense file for developing OM and PM instructions.

2.2.4.2. Determine OM and PM requirements for the equipment and ensure this information is correctly documented on the master equipment listing.

2.2.4.3. Determine recurring material and parts requirements.

2.2.4.4. Prepare OM and PM instructions.

2.2.4.5. Forward OM instructions to the using RCC in the product directorate as locally determined, or attach instructions to the equipment. Also, prepares maintenance procedures and instructions for inclusion into the maintenance documentation computer system.

2.2.4.6. Clear the suspense file.

2.2.4.7. Develop job safety analyses/precautions for inherent hazardous conditions or situations involved in the repair and preventive maintenance of industrial plant equipment (IPE).

2.2.5. PM Scheduling. PM actions are scheduled through the PM equipment specialist or maintenance documentation computer system as follows:

2.2.5.1. Generate/distribute copies of the PM work schedule. Each Plant Management Division determines schedule preparation.

2.2.5.2. Generate/distribute a PM WAD for each action on the PM work schedule, and, at the discretion of the ALC, for each PM action past due 7 days or more.

2.2.5.3. The Performing PM Function:

2.2.5.3.1. Uses the work schedule to make work assignments.

2.2.5.3.2. Provides feedback information on additional PM action that should be performed, frequency change, change in material requirements, equipment no longer located as indicated by the PM work schedule, etc.

2.3. Predictive Maintenance. A process of using electrical and mechanical testing and diagnostic devices to predict when a piece of equipment is deviating from its normal operating parameters. Predictive maintenance is not time schedule dependent. It is also designed to protect equipment capability and investment by removing causes of failure and making adjustment to compensate for normal wear before failure or an unsafe condition occurs.

2.3.1. Predictive maintenance includes:

2.3.1.1. Infrared Thermography. It can, after first baselining and analyzing for development of trends, warn of imminent failure in electrical circuitry and other utilities.

2.3.1.2. Oil Analysis. Immediate benefits are expected from the decrease in oil purchases by changing oil based on condition versus changing oil based on time.

2.3.1.3. Vibration Analysis. The vibrations that exist in all rotating machinery have unique "signatures." Detailed analysis makes it possible to identify abnormal signals and determine appropriate corrective action.

2.4. Operator Maintenance (OM). The Plant Management Division determines the specific OM requirements as identified under Maintenance Program Determination below. The requirements are documented and maintained with the equipment or in a readily accessible location. They will include, as a minimum, the nomenclature of the equipment, equipment identification number, frequency of maintenance action, and the actions required. Maintenance performed by the equipment operator falls into one of the following categories:

2.4.1. General OM. Applies to all equipment to insure serviceability and safety of the equipment prior to use. General instructions on cleaning and lubricating of ways and slides, filling and adjusting lubricators, checking sight and pressure gauges to ensure proper lubrication at correct pressure, etc. should be attached to each item of equipment or covered by product directorate operating instructions. The immediate supervisor will ensure general OM is performed adequately through casual observation. No daily certification of this OM performance is required. However, local directives may require general OM to be documented at their discretion.

2.4.2. Specific OM or Specific Servicing Inspections. This is equipment maintenance or inspection of a specific nature as identified on AFMC Form 306 or equivalent and performed by the owning organization/operator. The equipment operator will certify on the AFTO Form 244 that specific OM/specific servicing inspections have been accomplished. Operators will identify the type inspection/ maintenance performed (weekly, monthly, etc.) as well as time and date.

2.5. Maintenance Program Determination.

2.5.1. Types of Equipment. The Plant Management Division (TIP), with the aid of the product divisions, determines which equipment requires specific OM and the equipment to be included in the PM and predictive maintenance programs managed by TIP. Equipment such as bench grinders, bench drill presses, etc., generally requires only OM because of its simplicity and intermittent use. Equipment such as numerically-controlled machine tools, lathes, milling machines, boring machines, surface grinders, welding machines, balance machines, test stands, etc., that must be capable of producing to specific tolerances, normally requires specific PM or predictive maintenance by the PM function in addition to operator maintenance. The Plant Management Division will maintain a master listing of

maintenance responsibility by equipment number (including all OM, PM, and predictive maintenance).

2.5.2. Equipment Identification. All equipment will have a locally established equipment identification (ID) number. The ID number will be used to identify the owning organization and maintenance requirements. The Plant Management Division will identify the equipment it has maintenance responsibility over. All other equipment will be identified by the owning organization.

2.5.3. Maintenance Program Criteria. The following criteria are applied to determine whether an item of equipment (or a specific PM or predictive maintenance action) will or will not be included in the Plant Management PM or predictive maintenance program:

2.5.3.1. Equipment that would create an unsafe or hazardous environment if failure occurred due to lack of PM or predictive maintenance will be included.

2.5.3.2. All weapon peculiar equipment having specific PM requirements delineated by an applicable technical order (TO) will be included.

2.5.3.3. Equipment that is subject to breakdown repairs that are expensive compared to preventive or predictive maintenance will be included.

2.5.3.4. Equipment that is critical to production and where failure would result in costly downtime will be included.

2.5.3.5. Equipment that is not critical to the depot maintenance process (e.g., small drill press) and can be repaired without regard to downtime or equipment availability should be excluded.

2.5.3.6. Equipment of small dollar value, where the cost of PM or predictive maintenance is likely to exceed the cost of replacement upon failure, should be excluded.

2.6. Historical Records. The purpose of recording historical maintenance costs is twofold: First, it provides a sound basis for making decisions on whether to keep or replace an item of equipment when continued use becomes questionable due to maintenance cost. Secondly, it provides data for evaluating the effectiveness of the PM program and the need for possible adjustment.

2.6.1. Plant Management personnel will file AFMC Forms 388 or local equivalent for all items of equipment in the PM program. These records will be filed in machine identification number sequence.

2.6.2. Upon installation of a new item of equipment, the applicable product division engineering/planning branch will provide the information necessary to complete the AFMC Form 388 or local equivalent. This information will also be used for establishing an inventory of PM actions in the maintenance documentation computer system.

2.6.3. Plant Management personnel will track maintenance costs in the maintenance documentation computer system.

2.7. Equipment Documentation.

2.7.1. The shop supervisor, in coordination with the Plant Management Division, will ensure each piece of Plant Management maintained equipment has the following documentation, form(s) or computer equivalent attached or in the immediate vicinity of the equipment (in a reference/log book).

2.7.1.1. The AFTO Form 244/245 or computer generated equivalent will be used to document equipment delayed discrepancies, record service, periodic and special inspections, and to record inspection status and historical data in accordance with T.O. 00-20-5. AFTO Forms 244/245 or computer generated equivalent will be required on industrial plant equipment (IPE), ground support equipment (GSE or AGE), test, measurement and diagnostic equipment (TMDE), training equipment, lifting devices and other support equipment that have specific or unique inspection or preventive maintenance requirements. TMDE items that require calibration but have no scheduled inspections or PM requirements do not need an AFTO Form 244/245. The AFTO Form 244/245 is not required on common or special tools.

2.7.1.1.1. Specific Plant Management PM will be annotated in Section III. of the AFTO Forms 244/245. If the Facility and Equipment Maintenance (FEM) system is used, the phrase "SEE FEMS FOR PM" (or similar phrase) may be entered in Section III. in place of manually filling out this entire section. Plant Management will notify the shop supervisor/Product Directorate of all equipment over-due PM by more than one PM cycle (see para. 2.8.1.8.).

2.7.1.1.2. The shop supervisor will review the AFTO Form 244/245 or computer generated equivalent for correctness and accuracy at least quarterly and will annotate the review on the AFTO Form 244/245 (Section IV.) or computer generated equivalent.

2.7.1.1.3. Completed AFTO Forms 244/245 or computer generated equivalent will be kept on file by the shop supervisor for 90 days.

2.7.1.2. The AFMC Form 306 or computer generated equivalent will be used to identify frequency and specific instructions on preventive maintenance for specified equipment.

2.7.2. The Plant Management Division will ensure all equipment requiring Plant Management maintenance has the following documentation, form(s) or computer equivalent completed as required.

2.7.2.1. The Service Order will be used to initiate service from the Plant Management Division.

2.7.2.2. AFMC Form 388 will be used for historical information for the identified equipment. This data may be maintained in the maintenance documentation computer system.

2.8. Responsibilities.

2.8.1. The Product Directorate:

2.8.1.1. Will report the acquisition, installation, relocation, and removal of all industrial production equipment to the Plant Management Division with a Service Order.

2.8.1.2. In cooperation with the Plant Management Division, will confirm all assigned equipment is clearly identified with an equipment identification number.

2.8.1.3. Will provide data necessary for input/update to the maintenance documentation computer system along with the applicable technical manuals and commercial data for new acquisitions.

2.8.1.4. Will help the Plant Management Division determine factors on machine use that have a direct bearing on the establishment of practical PM or predictive maintenance actions and frequencies.

2.8.1.5. Will report any changes in owning organizational symbols when they occur so the maintenance documentation computer system inventory can be revised.

2.8.1.6. Will ensure all OM is accomplished at the prescribed frequencies.

2.8.1.7. Will cooperate with the PM personnel so PM actions can be completed as required and scheduled.

2.8.1.8. Will tag and remove from service (until proper PM is accomplished) all equipment identified by the Plant Management Division as overdue PM by more than one PM cycle. Equipment with PM cycles of 180 days or more will not exceed their PM due date by more than 60 days before being removed from service.

2.8.1.9. Will ensure form documentation is maintained for equipment under their control.

2.8.1.10. The Product Directorate will ensure the Plant Management Division PM equipment specialists are notified of actions concerning new, relocated, and turned-in equipment and provided technical data on AFMC Forms 388 or local equivalent on all newly acquired equipment.

2.8.2. The Plant Management Division:

2.8.2.1. Will establish maintenance requirements and monitor the PM program.

2.8.2.2. Will assign equipment identification numbers to all Plant Management maintained equipment items and maintain a master listing of these numbers.

2.8.2.3. Will schedule all Plant Management PM actions using the maintenance documentation computer system.

2.8.2.4. Will monitor and control all input and output of the maintenance documentation computer system.

2.8.2.5. Will prepare all specific OM and PM instructions.

2.8.2.6. Will provide necessary material support for the Plant Management PM program.

2.8.2.7. Will provide analyses and status reports as requested.

2.8.2.8. Will perform Plant Management PM actions according to the work schedule created by the maintenance documentation computer system.

2.8.2.9. Will notify the Product Directorate of all equipment overdue PM by more than one PM cycle.

2.8.2.10. Will maintain a central technical data file including commercial technical publications, technical orders, etc. as locally determined.

Chapter 3

TECHNICAL INSTALLATION PROJECTS

3.1. Technical Installations Concept. In general, except for emergency conditions, technical installations are projects which can be designed, planned, scheduled and implemented in an orderly manner. This provides the best use of Plant Management resources.

3.2. Procedures. Each ALC will establish an industrial board to process project requests. The charter of the Industrial Board, consisting of an advisory group and working group, will coordinate all facility and equipment work accomplishment.

3.2.1. Industrial Board Working Group. Industrial Board Working Group members will include a representative from all product directorates, base civil engineering (BCE), and Plant Management Division (chairperson). The objective of the working group is to clearly define work requirements, obtain correct approval, and update real property records. It will meet at least quarterly to review all major projects planned for accomplishment in industrial production facilities. The working group review will establish work priorities and provide the Industrial Board a clear perspective concerning future mission changes that must be supported at the center. It will also chart the avenue of accomplishment and identify correct approval levels.

3.2.2. Industrial Board Advisory Group. Industrial Board Advisory Group members will include all Product Directors, the BCE, and the Director of the Technology and Industrial Support Directorate (TI). The TI director will serve as the chairperson. The advisory group will meet at least annually to provide guidance and assistance to the Industrial Board Working Group.

3.2.3. Process Flow for DMAG Funded Work Requirements. BCE and the Plant Management Division (TIP) will jointly review work requests to determine the method of accomplishment and appropriate approval avenue. TIP is responsible for maintaining the IPE and BCE is responsible for facility and real property installed equipment (RPIE). Routine maintenance and repair work that is pure TIP work is sent directly to the TIP shop for accomplishment and the pure civil engineer work is sent to the BCE DMAG Zone for accomplishment. Work that is not pure maintenance and repair or cannot be clearly defined as industrial plant management or real property must be sent to the BCE for classification.

3.2.4. Work Requests. Requesting organizations will prepare and forward to the Plant Management Division a written request for all technical installation work required.

3.2.5. Initial Screening of Work Requests. The scheduling and control function:

3.2.5.1. Receives the project work request from the requesting organization.

3.2.5.2. Assigns a project control number and establishes a project folder.

3.2.5.3. Forwards the project to the engineering or planning function.

3.2.6. Approved Project Processing:

3.2.6.1. The engineering/planning function:

3.2.6.1.1. Develops the project work package as specified in chapter 5.

3.2.6.1.2. Forwards work package to the scheduling or material function.

3.2.6.2. The material function:

3.2.6.2.1. Receives a bill of material (BOM) from the engineering/planning function and works as specified in chapter 6.

3.2.6.3. The scheduling function:

3.2.6.3.1. Controls the work project as specified in chapter 4.

3.2.6.4. The plant management maintenance shop function:

3.2.6.4.1. Verifies and receives material from the material control function.

3.2.6.4.2. Accomplishes project work according to the work schedule.

3.2.6.4.3. Reports project status as required to the scheduling and control function. The minimum status reported will be the completion of the previous day's actual hours used on each project.

3.2.6.4.4. Enters the total actual hours used for the project on the AFMC Form 305, **Plant Management Work Order**, computer generated equivalent or as prescribed by local directives.

3.2.6.4.5. Returns all projects documents to the scheduling and control function.

3.2.6.4.6. Returns all excess materials (project residue) to the material control function.

3.2.6.4.7. Ensures that upon completion of a project, the signature of the requesting official, symbol, and date is placed in the last line of AFMC Form 305 or computer generated equivalent.

3.2.6.5. The scheduling and control function:

3.2.6.5.1. Audits the completed AFMC Form 305 or computer generated equivalent.

3.2.6.5.2. Provides management reports as required.

3.2.6.5.3. Assembles all documents for the completed project, updates the maintenance documentation computer system data base, and closes the project file.

3.2.6.5.4. Disposes of project files according to AFI 37-138, *Records Disposition Procedures and Responsibilities*.

3.2.6.6. The material control function processes excess material according to instructions in chapter 6.

Chapter 4

SCHEDULING

4.1. Installation Projects.

4.1.1. Work Planning. Efficient use of resources and timely accomplishment of Plant Management work requires advance planning by the scheduling and control function. This advance planning encompasses the following:

4.1.1.1. Identifying specific work to be done and acquiring engineering and planning data concerning resources required.

4.1.1.2. Determining resources available, including materials and manpower by skill.

4.1.1.3. Time phasing work accomplishment to satisfy the mission requirements of the product directorates. Weekly branch level meetings will be scheduled between the Plant Management Division (TIP) and the requesting directorates to determine the actual work schedule of supportable projects in an effort to minimize any production delays.

4.1.1.4. Applying available resources.

4.1.1.5. Continually updating schedules in response to changing work requirements, availability of resources and work progress.

4.1.2. Project Status Report Composition. The project status report is prepared weekly by the scheduling and control function using computer printouts, which aid advance planning. Although the report is produced weekly, continuous input will ensure updates are recorded as conditions change. The Project Status Report may consist of documentation or computerized listings designed for accurate updating.

4.1.2.1. The Project Status Report must:

4.1.2.1.1. Reflect the work planned to be in progress during the current week and those projected for accomplishment.

4.1.2.1.2. Reflect the anticipated availability of manpower resources. These resources are identified by skill within each Resource Control Center (RCC), and are stated in terms of work hours.

4.1.2.1.3. Relate the manpower available to the work planned to be in progress. This relationship must show that work has been scheduled to fully use manpower resources. However, the plan should also preclude the release and scheduling of too much work to the TIP shops.

4.1.2.1.4. Show the following additional data:

4.1.2.1.4.1. Project control number.

4.1.2.1.4.2. Work or project nomenclature.

4.1.2.1.4.3. Work priority.

4.1.2.1.4.4. Requester’s office symbol.

4.1.2.1.4.5. Planned start and completion dates.

4.1.2.1.4.6. Remarks or status.

4.1.3. Analyses and Reporting. The specific analyses to be performed and types of reports to be generated are left to the discretion of local management. However, the following minimum requirements must be satisfied:

4.1.3.1. Visibility of the total workload backlog must be maintained and reflect the situation relative to the type of workload, priorities, work hours by skill, and current status (for example, awaiting planning, material, scheduling, etc.).

4.1.3.2. Revalidation of the work requirement must be assured, when work is not completed on time.

4.2. Emergency Repairs.

4.2.1. Scheduling and Control. To hasten response to repair work, the trouble call desk will receive emergency requests and relay the work requirements to the maintenance function. The trouble call desk acts as the communication center through which all instructions and requests for service are passed to TIP repair crews

4.2.2. Trouble Call Desk. The trouble call desk will input all appropriate information such as priority, date and time received, requester's name, phone number, and organization, equipment ID number, repair shop number, skill requested, and a description of the problem into the maintenance documentation computer tracking system. This information is then electronically transmitted to the appropriate repair shops. At the discretion of the ALC, the BCE and TIP trouble call desks may be combined.

4.2.3. Control of Work. Chapter 2 contains control procedures related to this category of work.

Chapter 5

ENGINEERING AND PLANNING

5.1. Responsibilities.

5.1.1. All product directorate requests for Plant Management to perform nonreal facility and equipment installation, relocation, modification or removal are processed through Plant Management Engineering/Planning.

5.1.2. Engineering and Planning Personnel are Responsible for:

5.1.2.1. Holding Pre-Design and/or Pre-Construction meetings when appropriate based on project complexity.

5.1.2.2. Accomplishing final design load calculations on existing utility distribution systems and all engineering, drafting, and planning associated with all project work done by the Plant Management Division including safety and environmental issues.

5.1.2.3. Preparing and processing documents for contracting of Plant Management work.

5.1.2.4. Accomplishing preliminary engineering design drawings or sketches for AF Form 332, **Base Civil Engineer Work Request**, for work required by Plant Management and other divisions which do not have engineering staffs.

5.2. Project Approval System Data.

5.2.1. Requests for Plant Management project support must be approved either through the approval system or through procedures established by the Industrial Board, see paragraph 3.2.

5.2.2. No requested project will be engineered, planned, designed, or submitted to Plant Management shops for accomplishment until approved. Some preliminary planning by the engineering function may be required to determine cost estimates.

5.3. Work Package. For each approved project to be accomplished by the Plant Management Division, the engineering and planning function must develop a work package. Basically the work package contains all planning documents and data necessary to requisition material, resources, and to accomplish the project.

5.3.1. Assembled work packages are sent to the scheduling function for control and subsequent scheduling to the shops.

5.3.2. The work package should contain the following:

5.3.2.1. A written request submitted through the requester's Engineering/Planning Branch.

5.3.2.2. Engineering drawings or sketches prepared or revised by Plant Management Engineering/Planning.

5.3.2.3. AFMC Form 305 or computer generated equivalent.

5.3.2.4. Bill of Materials (BOM).

5.3.2.5. AF Form 813, **Request for Environmental Impact Analysis**, with proper coordination obtained by the requesting organization.

5.3.2.6. AFMC Form 299, **Safety, Fire and Health Reviews**, with proper coordination obtained by the requesting organization.

5.3.2.7. Vendor or manufacturer's data or copies of current catalog sheets of material required, when appropriate.

5.3.2.8. DD Form 1348-6, **DOD Single Line Item Requisition System Document**, for non-stock-listed material or equivalent.

5.3.2.9. AFMC Form 206, **Temporary Work Request**.

5.3.2.10. If project has a Safety Hazard Risk Assessment Code (RAC) 3 or higher, include the Automated Hazard Abatement Printout provided by safety.

5.4. Plant Management Work Order.

5.4.1. The AFMC Form 305 or computer generated equivalent serves two purposes. First, it authorizes the accomplishment of work by the Plant Management Division shops when completed and approved by the engineer/planner and by the scheduler. Secondly, it outlines the major tasks to be performed by specialized skills, i.e., millwrights, electricians, pipe-fitters, etc.

5.4.2. The crew chief or supervisor will initial the form when the task is completed. The Plant Management engineering personnel or engineering technician as well as the requester engineer will sign the form whenever the project is completed.

5.5. Direct Production Activity Support. When the Plant Management Division requires the assistance of personnel assigned to direct labor activities, such support is accomplished using an AFMC Form 206.

5.5.1. AFMC Form 206 is processed through Resource Management to the Engineering/Planning Branch of the directorate providing aid to the Plant Management Division. A copy is filed in suspense pending receipt of a copy of the temporary job record, which authorizes the direct labor shop to do this work.

5.5.2. Upon receipt of the temporary job records, the AFMC Form 206 is removed from suspense and filed in the project work package file. The temporary job record is held for coordination purposes pending completion of the work requested. Upon completion, the temporary job records will also be filed in the project work package file.

5.6. BOM Preparation. Material required for a project will be entered on a Bill of Material (BOM). The BOM will serve as a source document for use by the material control function to issue and requisition materials and also to accept the return of unused material from the shop at the completion of the project.

5.6.1. The Engineering/Planning Branch will determine the type and quantity of material required by the Plant Management shops to complete each project. The quantity of material must be determined with care to avoid both material shortages or undue excesses

5.6.2. The design engineer, material planner, or engineering technician will review on-hand and residue material inventories for utilization in the performance of installation, removal, or repair projects requiring a BOM. Projects will be planned to utilize on-hand or residual inventories whenever possible to reduce on-hand inventories and generate stock turnovers.

5.6.3. On-hand and residue material selected for a project BOM will be allocated in the maintenance documentation computer system against the project to update current on-hand inventories.

5.7. Engineering Drawing or Sketch Preparation. Good judgment must be exercised in preparing engineering drawings and sketches to be used by the Plant Management shops. These drawings and sketches should be no more sophisticated than necessary to accomplish the job, particularly when a permanent record is not required or one-time use is involved. Thus, engineering and planning costs must be minimized.

5.8. Estimated Project Work Hours. The planning function determines the skill and organization to perform each project task and estimates the work hours required. Base work hour estimates on available standards, the planner's experience, time studies and discussions with shop personnel. For project type work, these estimates are entered in the estimated hours column of AFMC Form 305 or computer generated equivalent.

Chapter 6

MATERIAL CONTROL

6.1. Material Control Elements. The material used by the Plant Management Division for direct mission support is classified into four broad categories. This material may be controlled by a material storage warehouse or indirect bench stock. (Note: The material control function may be called "material management" at some centers.)

6.1.1. Project Material. Is material ordered specifically to support a work request and is managed, controlled, and stored as a separate entity.

6.1.2. Bench Stock. Those common usage items including raw or bar stock having an expendability, recoverability, reparability category (ERRC) of XB3 that have a history or projected usage within the Plant Management Division.

6.1.3. Insurance Items. Ordered on a planned basis to ensure replacement parts are available to repair specific critical machines and equipment. These items are carried in the material management computer system and are used to provide immediate response, but do not have sufficient usage experience to provide a level. These items will be stored in the central area in a quantity as required and coded as insurance items.

6.1.4. Equipment Repair Parts. Non-common parts available only from machine or equipment manufacturer and not stockpiled as insurance items.

6.2. Material Control Responsibilities. Material management and control is the responsibility of all personnel assigned to the division, from clerical personnel using office supplies, to the individual mechanic on the shop floor. Plant management material control is divided into four functions: development of requirements; planning of material stockage levels and locations; material data documentation; and physical handling of the material before issuing to the shop mechanic. Each ALC will develop a local operating instruction to identify the responsible organization performing the following functions:

6.2.1. Development of Requirements.

6.2.1.1. Includes research and identification of equipment material usage requirements.

6.2.1.2. Establishes a secure area for insurance items.

6.2.2. Planning Material Stockage Levels and Locations.

6.2.2.1. Determines general locations and establishes contents and levels for bench stock issue points.

6.2.2.2. Reviews data management products to determine past consumption, a 30-day stock objective, and reorder point.

6.2.2.3. Reviews management products to determine excess or inactive items and takes appropriate disposition or deletion action.

6.2.2.4. Monitors material handling procedures to make sure established procedures are properly followed.

6.2.3. Material Data Documentation. Utilizes the material management computer system to determine and identify specific material information (i.e. bench stock locations, bin numbers, usage rates, etc).

6.2.4. Physical Handling. Identifies the physical handling and movement of material used within the Plant Management Division. Various procedures and codes used in requisitioning material are found in AFMCI 21-130, *Maintenance Material Control*, and AFMCMAN 21-3, *Exchangeables Production System (G402A) Users Manual*.

6.3. General Guidelines.

6.3.1. Bench Stock and Warehouse Items. Are limited to those common usage items having an ERRC of XB3 with a history of usage or items having a projected usage.

6.3.2. Storage Areas. Should be located to provide for maximum efficiency of the Plant Management Division, as well as for adequate security of the stored material. Storage areas may include, but are not limited to, special enclosed secured areas for glamour, critical, or other controlled material, and open display bins with free access to parts dispensers located directly in the shops. As a minimum, the bench stock should consist of a centralized location providing security and control for material requirements. However, additional centralized locations or satellite locations are authorized if local requirements exist justifying expansion of the single location concept.

6.3.3. Usage Level. Normally, the central bench stock is maintained at a 30-day usage level. This supply level may be exceeded between the central bench stock areas and selected operating areas. Material issued and in the possession of the production shop won't be considered as part of the 30-day stockage objective. Only serviceable material will be maintained or stored in the bench stock bins or storage areas.

6.3.4. Insurance Items. Will be maintained in a location separated from bench stock, equipment, and project material.

6.3.5. Project Material.

6.3.5.1. The Product Division's Engineering/Planning Function must identify all items of equipment required in support of a given workload and inform the equipment custodian of the requirement. This function must also provide the system specifications and requirements to the Plant Management Division.

6.3.5.2. The Equipment Custodian is responsible for requisition of equipment items.

6.3.5.3. The Plant Management Division is responsible for requisition of items required for the installation and the proper function of the system. All items (except equipment) are to be ordered as indirect material.

6.3.5.4. The engineering or planning function must prepare bills of material (BOM) for each involved shop in support of projects. Fill BOMs from on-hand bench stock to the maximum extent possible. Move available bench stock to a separate project material location identified with a bin number within the central bench stock area or to a secure project holding area. Replenish stock based on the quantity remaining on hand in the normal bin location.

6.3.5.5. Order items not available from bench stock through depot supply or through local purchase channels, as appropriate.

6.3.5.6. Bills of material (BOM) should be annotated with quantity required, unit of issue, item number, description, part number, storeroom, bin location, bin quantity, unit price and line cost as the material is received into the project storage area. When status is received which appears unsatisfactory, notify the planner or scheduler. When all material is on hand for a particular shop, notify the appropriate planner or scheduler.

6.3.5.7. Material will not be issued to the shops until the project is released by the scheduling function.

6.4. System Description . The D035K or material management computer system is used for control of material stored to support the Plant Management Division workloads. Applicable data products are generated as part of the D035K or material management computer system. Plant Management Division material control personnel update the data system and process shipments of bench stock requirements via remote terminals.

6.5. Bench Stock Responsibility .

6.5.1. Material Control Personnel are responsible for the following items:

6.5.1.1. Determine location and establish contents and levels for bench stock issue points.

6.5.1.2. Use D035K or the material management computer system to determine past consumption and compute 30-day stock objective and reorder points. A quarterly review will be used to initiate changes to the authorized level to match the computed level and recommend the deletion of items no longer required or authorized from the D035K or computer system listing. The demand level from previous history will dictate the need and allows for the recommendation to include new bench stock items.

6.5.1.3. Validate items justifying the bench stock special levels or insurance items and authorize input to D035K or the material management computer system quarterly. Review management actions to determine excesses or inactive items; initiate necessary action in coordination with engineering/planning function. Coordinate with the plant management shop supervisors as necessary.

6.5.1.4. Review listing, received from base supply, of authorized insurance items input to the D035K or material management computer system under special level procedures.

6.5.1.5. Review each bin location on a weekly basis and replenish stock as necessary to ensure a 30-day supply is on hand.

6.5.1.6. Verify stock number and quantity received with material delivery document.

6.5.1.7. Ensure sensitive coded items are secure from pilferage and issued directly to authorized personnel.

6.5.1.8. Initiate AFMC Form 95, **Issue Request**, or computer generated equivalent. Document for turn-in of material as required.

6.5.1.9. Identify, store, and maintain bench stock shelf-life items. Physically check on a routine basis to ensure shelf life material is current and is properly marked and stored.

6.5.1.10. Accomplish stocklist changes (SLC) to bench stock, bin cards, or tags.

6.6. Bench Stock Data Products.

6.6.1. Distribution of data products will be prescribed locally.

6.6.1.1. A paper or electronic copy of the bench stock inventory list will be produced and used in the event of a computer outage.

6.6.1.2. Bin Tags - the material management computer system. Bin tags/labels (tags or bar codes) contain NSN, unit of issue, quantity authorized, bin location, station number, part number, shelf-life code, noun and date of last quarterly review.

6.7. Storage. All material in storage will be protected as required by AFI 23-111, *Management of Government Property in Possession of the Air Force*.

6.7.1. Tagging:

6.7.1.1. Bench stock items will only contain serviceable assets so individual tagging is not required. If a condition tag is used, one tag will suffice for the entire quantity in a bag, box, bin, etc.

6.7.1.2. Raw stock material does not require condition tags but must be identified as required in T.O. 420-1-3 or have legible mill markings. If raw stock is maintained in bins, material control personnel must attach bin labels to identify this material.

6.7.1.3. Shelf-life item control is performed as follows:

6.7.1.3.1. Material control personnel in bench stock areas must ensure that age-control and cure-dated materials are stored, updated, and purged. Items must be segregated and storage areas must be conspicuously marked with a file card identifying shelf-life stock number, manufacturer's part number or military specification, and shelf-life code for the item stored therein. Age-dated material must at all times have age control date (either date of manufacture or expiration date) indicated on each container.

6.7.1.3.2. Material control personnel must check at least monthly to ensure shelf-life material in bench stock areas is current, properly marked, and stored. Outdated items must be removed from stock unless documentation or re-inspection permits retention.

6.7.2. Storage for Sensitive Items. Sensitive item control is handled as follows:

6.7.2.1. Control of critical and sensitive items is the responsibility of the material control function. These items are stored and maintained in a secure storage area. Issue must be made directly to the technician from this area.

6.7.2.2. Pilferable material must be maintained in secure storage area. Issue must be made only to authorized personnel.

6.7.2.3. Stamp the authorized document for sensitive material "Sensitive Item".

6.7.2.4. A copy of the document must be signed when the material is received. If sensitive material becomes excess and requires turn-in to Supply, the turn-in document is stamped "Sensitive Item". A copy of the document must be signed when the material is received.

6.7.3. Control of Hazardous Materials. Hazardous material is handled as follows:

6.7.3.1. Control of hazardous material is the responsibility of the material control function. When the material is issued, responsibility is transferred to the individual receiving the item. Hazardous material is controlled according to AFOSH STD 91-100 and local procedures.

6.7.3.2. Only those hazardous materials essential to plant management workloads are stocked in their shops. Before placing chemicals in the centralized or operational storage areas, mark the containers clearly with Corrosive, Flammable or Poison warning label. Label all substitute containers used to dispense hazardous materials with the same identification and warning as the original container. If the container is smaller than the label, use an appropriate blank label to identify the container with contents and attach the words Poison, Flammable, or Corrosive.

6.7.3.3. Review all hazardous materials stocked in the centralized and the operational storage areas and purge unidentified chemicals from this stock as identified in AFOSH STD 91-100 and local operating instructions.

6.7.3.4. Location of Hazardous Material:

6.7.3.4.1. Assigned material will have a designated storage location.

6.7.3.4.2. Backup material for operating locations may be located in the shops provided they are properly secured.

6.7.3.4.3. Hazardous material will not be stored in bench stock area.

6.8. Inventory.

6.8.1. Random inventories of bench stock will be conducted at least monthly using material management computer system inventory reports. If the physical inventory deviates from the reported on-hand inventory by 10 percent over a 3 month interval, the Material Branch Chief will direct a selected random inventory of other stock items to ensure the affected stock items are not an anomaly. If the comparative stock numbers are also out of range from the reported inventory, the Material Branch Chief may initiate a complete physical inventory of the affected stock storage area.

6.8.1.1. Bench stock areas will normally be exempt from wall-to-wall inventories unless there has been an unusual demand for bench stock items or the inventory is directed by the Material Branch Chief.

6.9. Equipment Repair Parts.

6.9.1. Requisitioning Repair Parts. The Plant Management Division, using the material management computer system to record supply requisitions, orders all repair parts for installed equipment with the following exceptions:

6.9.1.1. Refer exchange type items to the supporting warehouse for requisitioning.

6.9.1.2. Equipment items with an ERRC of "U" or "S" are ordered by the equipment custodian, using AF Form 2005, **Issue/Turn-in Request**, or AF Form 601**, Equipment Action Request**. Turn-in of the reparable equipment item will clear the custodian's account.

6.9.1.3. The Plant Management Division's engineering/planning (equipment specialist) function is responsible for all technical research regarding item descriptions, specifications, and possible alternate items.

6.10. Excess and Residue Turn-ins.

6.10.1. Material on hand, identified as excess to the computed 30-day requirements will be processed as follows:

6.10.1.1. If the material maintains an active usage rate, it may be retained in the centralized storage area and attrited by normal consumption.

6.10.1.2. If the material does not have an active usage rate, verify another requirement for the material by checking the Bench Stock Inventory List, D035K or material management computer system, which shows all material users for each stock number, or by contacting applicable item managers, or supply clerks. If the item is a current usage item, the material may be issued and manual debit or credit to the applicable Resource Control Centers (RCCs) will be made by Maintenance Cost Accounting, if the value of the material exceeds $25.

6.10.1.3. If no other DMAG users are found, the material must be turned into supply. Material returned to supply for credit or non-credit must be returned by the units of issue stocklisted. Only serviceable material will be returned to supply and will be condition tagged, unless material is still in original manufacturer's package. Small items being returned to supply require only one tag per package if the individual packaging of the item is not practical.

6.10.1.4. Serviceable residue material may result from overestimating requirements, units of issue exceeding requirements on bills of material, or from serviceable items removed to facilitate new installations. When serviceable residue consists of usable material it may be placed in residue status.

6.10.1.5. All other serviceable residue is handled as follows:

6.10.1.5.1. When possible, the material is turned in to supply for credit.

6.10.1.5.2. Store the residue in the material control facility when a potential use exists for future plant management. Segregate the material from bench stock material, properly store, and identify. It should be inventoried in the material management computer system. The identification should reflect the NSN, noun, quantity, the fact that the material is residue, and the storage date. Identify this material using a locally-prescribed format, which will be sent to the engineer and planning function. The engineering/planning function must review residue material and consider the use of this material in the planning of new projects instead of ordering new material. Residue material may be retained for 1 year. After 1 year, the material is reviewed for further retention or turned in to supply if no activity has occurred.

6.10.1.5.3. Unserviceable residue will be turned in to the Defense Reutilization and Marketing Office (DRMO) by bench stock personnel. Prepare turn-in documents using DD Form 1348-1, **DOD Single Line Item Release/Receipt Document**, prepared in six copies for each type metal or type material turned in. One copy is retained in scheduling and material control and five forwarded with the property; one copy is returned acknowledging receipt by DRMO. Electronic receipts can be used in accordance with local directives.

6.10.1.5.4. When industrial fund scrap is turned into the DRMO, its identity is indicated on the turn-in document. The industrial fund account to which sale proceeds are deposited is also entered. Process these transactions as described in AFMAN 23-110, Volume 6, Chapter 2, *Excess and Surplus Personal Property.*

Chapter 7

TOOL CRIB MANAGEMENT

7.1. Responsibilities.

7.1.1. The Plant Management Division has custodial authority over all TIP managed tool cribs. Product Directorate tool issue centers and production support centers will be designated at the local level for custodial responsibility.

7.1.2. The Plant Management Division will provide center tool marking services for DMAG funded organizations and ensure tools are marked prior to issue according to AFMCI 21-107, *Tool Control and Accountability Program*.

7.1.3. The Plant Management Tool Crib Manager is responsible for:

7.1.3.1. All tools and equipment stored within all Plant Management tool issue centers.

7.1.3.2. Maintaining records for all equipment and tools in tool kits and tool cribs.

7.1.4. Product Directorates are responsible for:

7.1.4.1. Preparing AF Form 601.

7.1.4.2. Preparing sole source letters, as applicable.

7.1.4.3. Preparing DD Form 1348-6, **Single Line Item Requisition/Release/Receipt Document**, for all new workloads.

7.1.4.4. Ensuring tools are not ordered (or duplicated) by any organization other than Plant Management.

7.1.5. 5. Coordinating/notifying the TCM of tool crib or mobile tool truck operational requirements for contingency and extended operating hours (other than day shift).

7.2. Tool Management.

7.2.1. Concept of Tool Support. The master tool crib acquires, stores, issues and controls all tools used by the Product Directorates. Satellite tool cribs, production support centers or the center tool issue center will also support the production shops through temporary loan of tools and task kits.

7.2.2. Master Tool Crib and Master Tool Crib Warehouse.

7.2.2.1. Master tool crib and master tool crib warehouse stock common hand tools, special tools, precision measurement equipment (PME) and other items as required, which lend themselves to tool crib control, based on the following:

7.2.2.1.1. Up to a 90-day level of items subject to wear and breakage may be maintained to replace unserviceable items.

7.2.2.1.2. An adequate quantity must be maintained to satisfy normal daily demands for temporary items.

7.2.2.1.3. Stock levels and reorder points must be posted on each bin. These levels will be established by tool and parts attendants based upon usage data in the tool inventory management computer system or by establishing a special level based upon management’s discretion.

7.2.2.1.4. Tools in excess of the 90-day level resulting from the turn-in and disassembly of tool kits may be retained, if the excess can be disposed of by attrition. Such excesses must be used to maintain and reduce stock levels instead of acquiring additional tools from the supply activity.

7.2.3. Acquisition of Tools and Equipment.

7.2.3.1. Plant Management personnel are responsible for acquisitioning tools for the Product Directorates. Tools or equipment items will not be purchased by organizations other than Plant Management personnel unless written approval is obtained from Plant Management. All tool purchases must be reported to Plant Management personnel for input into the tool inventory management computer system for accountability and tracking purposes. If credit card (IMPAC) purchases are authorized, tool purchases must be reported to Plant Management personnel (upon receipt of items) for input into the tool inventory management computer system.

7.2.3.2. Acquisition of Tools as Contractor Acquired Property (CAP). Product Directorates are responsible for ensuring tools are not ordered (or duplicated) by any using organization other than Plant Management. All government purchased tools and equipment items in the possession of contractors and contractor acquired property will be identified, accounted for, and tracked by Plant Management personnel in the tool inventory management computer system. Upon turn-in of contractor acquired property, the Tool Management Section Branch Chief will have the tools inventoried and discrepancies reported prior to the Plant Management function accepting responsibility for the tools.

7.2.4. Tool Disposal. Each center will ensure local procedures are in place for disposal of tools to DRMO or demilitarization contractors. Tool crib parts attendants will prepare turn-in documents using Form 1348-1 or a local equivalent and retain a copy verifying receipt by DRMO. This copy will be retained for 1 year. The tool inventory management computer system will be updated to show tool items deducted from the inventory due to disposal. A record of tool turn-in, by tool type and quantity must be kept on file for 1 year.

7.2.4.1. Warranty-Replacement Program. All tools and equipment will be reviewed for warranty-replacement before disposal of item to DRMO or demilitarization contractors. If the tool is under warranty, the tool crib parts attendant will ensure a replacement tool is obtained from the vendor and will properly annotate the warranty exchange in the tool inventory management computer system.

7.2.5. Tool Kit Procedures.

7.2.5.1. Tool Kit Type Composition. The production engineer or planner along with the RCC supervisor and technicians must determine the composition of all tool kit types required by the Resource Control Center (RCC). Once determined, the Product Directorate's Production and Engineering branch levels must give approval prior to submission to Plant Management for implementation.

7.2.5.1.1. Any changes to tool kit type composition must be approved in writing by the Product Directorate Production Branch Chief. The composition of the kits should be the same for all employees possessing the same skill who are working in the same RCC. A kit may be used by an individual or group depending on the RCC requirement.

7.2.5.1.2. The RCC supervisor must furnish the tool issue center a list of tools required for each kit type proposed to be established and of all changes recommended in the composition of existing kit types.

7.2.5.1.3. The Product Directorate will review kit types to avoid unnecessary proliferation of the number of kits used by the Product Directorates and will seek standardization to the degree practical.

7.2.5.2. Tool Kit Custodial Receipt Listing (TKCRL) Preparation. The tool issue center will prepare a TKCRL for each kit of a given tool kit type composition. These listings will be used for issuing tool kits. The minimum contents of the listing are:

7.2.5.2.1. Kit Identification Number.

7.2.5.2.2. National Stock Number (NSN) or equivalent.

7.2.5.2.2.1. An accurate description of a tool may be substituted for NSN on nonstandard tools that are not stocklisted. The manufacturer's part number or equivalent will be included in this description.

7.2.5.2.3. Nomenclature.

7.2.5.2.4. Unit of issue.

7.2.5.2.5. Quantity issued.

7.2.5.2.6. Date of issue.

7.2.5.3. Tool Kit Issue Procedure:

7.2.5.3.1. When possible, the RCC supervisor must notify the Plant Management tool issue center in writing of a required tool kit 30 days before the ”need” date. This request must provide the employee's name, cost code account, and the required tool kit type.

7.2.5.3.2. The tool issue center assembles the requested tool kit utilizing a given tool kit type composition or Table of Allowance (TA).

7.2.5.3.3. The tool issue center issues the tool kit, using three copies of the TKCRL. The employee signs and dates the TKCRL and initials back orders when they are received.

7.2.5.3.3.1. Items not available for issue are annotated “B/O” (back order) on the TKCRL. When back ordered items are received they are subsequently issued and the TKCRL is updated to reflect receipt of the back ordered items.

7.2.5.3.3.2. The tool issue center attendant ensures the employee's organization, date, and printed name appears on the listing. The tool issue center attendant and employee will inventory (match tool NSN and quantity) prior to employee signature on the TKCRL. The employee must acknowledge receipt and responsibility for the tool kit by signing and dating all three copies of the TKCRL or the original Photostat copy. NOTE: Each employee issued government property should be advised of their responsibilities for the custodial care of that property according to AFI 23-111, *Management of Government Property in the Possession of the Air Force* and AFMCI 21-107, *Tool Control and Accountability Program.*

7.2.5.3.4. The tool issue center retains, on file, the original copy of the TKCRL. One copy is returned with the employee to be given to the employee's supervisor which will be maintained on file. The second copy is given to the employee for retention in the tool kit.

7.2.5.4. Tool Replacement Issue. Employees issued tool kits may exchange worn or broken tools with the tool issue center on a one-for-one basis. The replacement must be marked before issue. Evidence of exchange requirement is necessary. If broken, essentially all pieces must be presented. If lost, a copy of AFMC Form 310, **Lost Tool Report**, with blocks 1-11 completed, must be presented before a replacement tool may be issued.

7.2.5.5. Tool Kit Turn-In and Turn-Around Procedures:

7.2.5.5.1. Supervisors must ensure employees turn in their tool kits to the tool issue center upon changing assignment from one organization to another, changing tasks which require a different tool box configuration, or termination of employment.

7.2.5.5.2. The tool issue center attendant removes the employee's TKCRL from file. The tool issue center attendant verifies all tools are marked with the proper kit ID number and then verifies the turn-in of all issued tools. A copy of' the listing must be annotated “turned-in,” dated, and signed by the tool issue center attendant on the receipt acknowledgment or signature block. A copy of the listing is returned to the employee as a receipt. The tool issue center will maintain a file copy of the listing for 2 years.

7.2.5.5.3. Tools not marked or misidentified will be accepted but not credited for turn-in against that listing. The original TKCRL must be annotated to reflect missing tools and retained by the tool issue center until correct tools have been returned or a copy of the lost tool report, initialed by the employee, has been presented. The tool issue center supervisor must notify the appropriate supervisor of any discrepancy.

7.2.5.5.4. If shortages exist, the TKCRL must be retained by the tool issue center until final action has been taken on all shortages.

7.2.5.6. Other Tool Kit Policies:

7.2.5.6.1. The tool issue center may retain turned-in tool kits for reissue when a future need is anticipated.

7.2.5.6.2. Tool kits no longer required for reissue are disassembled and serviceable items placed in the tool issue center operating stock locations.

7.2.5.6.3. Normally, no employee may be issued more than one individual tool kit on a permanent basis. However, employees temporarily detailed to another job may be issued an additional kit for the duration of the detail only.

7.2.6. Temporary Tool Loans.

7.2.6.1. General. Tool issue center personnel will make temporary loans of common hand tools, special tools, PME, and other items stocked in the tool issue center only to authorized product directorate personnel and Contract Field Teams (CFT) as prescribed in local directives.

7.2.6.2. Duration of Loans. Use the following criteria in determining the duration of tool loans:

7.2.6.2.1. Common tools are loaned for a period not to exceed 30 calendar days. If tools are required for special projects, unique modifications or for extended reasons beyond this 30 cal-

endar day period, the Production Branch will generate a letter indicating the time requirements for the loan or to request that the tool be added to a particular tool kit.

7.2.6.2.2. Critical items and special equipment are loaned for only the duration of the shift during which they are borrowed. The tool issue center supervisor must designate, in writing, these items.

7.2.6.2.3. Precision Measurement Equipment (PME) will not be loaned for more than 30 calendar days or for any period of time which will exceed its calibration due date minus 7 calendar days without an approval letter from the Production Branch.

7.2.6.3. Temporary Loan Record. Temporary loans are accomplished using one of the following:

7.2.6.3.1. AFMC Form 307, **Temporary Loan Record**.

7.2.6.3.2. AF Form 1297, **Temporary Issue Receipt**.

7.2.6.3.3. Tool Inventory Management Computer System.

7.2.6.4. Control Of Overdue Tools:

7.2.6.4.1. The tool issue center must notify the borrower, through the supervisor, of all over-due items which must be returned immediately to the tool issue center.

7.2.6.4.2. If overdue items are not returned within 5 workdays after initial notification, a second notification is sent to the borrower's supervisor. Discrepancies not corrected or recurring will be elevated to the appropriate branch chief. The Production Divisions are responsible for ensuring all overdue loaned tools are returned or that the loan is renewed. The tool issue center will provide a monthly listing of all overdue loaned tools to the Production Divisions.

7.2.7. Special Loans.

7.2.7.1. The tool issue center will support product directorate temporary duty (TDY) teams with necessary tools and PME on a short-term loan for the duration of the TDY in accordance with locally prescribed procedures.

7.2.7.2. PME requiring calibration while on TDY will be calibrated at the nearest Precision Measurement Equipment Laboratory (PMEL).

7.2.8. Lost, Damaged, or Destroyed Property.

7.2.8.1. Military and civilian personnel will be held financially liable for the loss, damage, or destruction of government property issued to them, when caused by their gross negligence, willful misconduct or deliberate unauthorized use. The terms damage or destruction do not include wear and tear resulting from normal use. The immediate supervisor must initiate action, as specified in AFI 23-111, *Management of Government Property in Possession of the Air Force*, for all tools issued which cannot be turned in due to loss or returned to the tool issue center damaged or destroyed. This includes all temporary loan and tool kit issues.

7.3. Physical Inventory and Inventory Adjustments.

7.3.1. General Inventory Elements.

7.3.1.1. Prior to conducting an inventory, the computer records will be backed up. This record shall be maintained for a period of 3 years to ensure inventory changes are auditable.

7.3.1.2. Sample inventories will be conducted at least semi-annually by all tool cribs (master tool crib, master tool crib warehouse, and satellite tool cribs).

7.3.1.3. Inventory adjustments will be approved by the section supervisor or higher management. An inventory adjustment variance report resulting from special or regularly scheduled inventories and all stock and price change vouchers will be prepared and forwarded to the Plant Management Division Chief. The Plant Management Division Chief will maintain this variance report for a period of 1 year.

7.3.2. Inventory Procedures.

7.3.2.1. Preparatory Responsibilities. Prior to planning an inventory, the Tool Management Section Branch Chief will appoint an inventory supervisor for the planned inventories. This person has overall responsibility for planning, coordinating and executing the inventory. Personnel assigned to perform the inventory shall work under the direction of the inventory supervisor for the duration of the inventory.

7.3.2.2. The Tool Management Section Branch Chief shall determine the personnel resources required to perform the inventory and assign personnel to the task. Personnel assigned to the tool crib being inventoried will not be involved in taking the inventory or making inventory adjustments. They may serve as advisors for the inventory team. Advisory functions shall be limited to assisting in locating or describing tools.

7.3.2.3. Inventory personnel will accomplish the following:

7.3.2.3.1. Establish an inventory cut-off date and time for the tool crib(s) to be inventoried.

7.3.2.3.2. Notify customers that the tool crib(s) will be closed for inventory. Each ALC will develop a plan on what the hours will be for each inventory.

7.3.2.3.3. Arrange for tool supplies to be available to customers if inventories are taken during normal operations. This may include stationing the mobile tool crib in the area serviced by the crib being inventoried.

7.3.2.3.4. Perform a pre-inventory clean up of the tool crib. This clean up is to include ensuring only one stock number is in a storage location; ensuring all storage locations are properly identified; locating all stock in a storage location; and separating damaged or reparable inventory. Tools not part of the tool crib inventory will be transferred to the correct crib prior to starting the inventory.

7.3.2.3.5. Ensure that bin tags properly identify bin location and contents.

7.3.2.3.6. Ensure that storage locations are properly identified. This includes visible location markings for each cabinet, drawer, etc.

7.3.2.3.7. The inventory supervisor will designate in writing who will reconcile computer records for inventory adjustments to reflect the current inventory status.

7.3.2.3.8. Document Control. The tool control system administration function will prepare computer listings for items to be inventoried. All tools and kits within the physical confines of the crib should be inventoried. Listings should provide the stock number, description, bin location and unit of issue plus columns for the physical count, counter initials, computer count, computer operator initials, recounts and re-counters initials.

7.3.2.4. Inventory Counts.

7.3.2.4.1. The inventory supervisor will appoint personnel as inventory checkers. Inventory checkers will compare the physical count of the inventoried items at their storage locations to the balance in the tools inventory management computer system. If the computer balance and physical count do not agree, the inventory supervisor will direct a recount be performed. Any overage or shortage will be recorded on the computer listing, including storage location.

7.3.2.4.2. Original packages will be opened if information on the outside is insufficient to indicate quantity and/or description of the contents. If the information is sufficient, the count should be accepted as accurate.

7.3.2.4.3. Mixing of Stock Numbers. Storage locations shall have only one stock number stored in the location. If mixed inventory is found, the tool and parts attendant will correct the problem before the parts are inventoried.

7.3.2.4.4. Weighing Expendables. Count scales may be used to obtain an item count. Scales will be designed for the tasks, be in good repair, and contain provisions to accurately weigh samples. Operating procedures and sample sizes are to comply with the scale manufacturer's guidance.

7.3.2.4.5. Inventory Adjustments Other Than Scheduled Physical Inventories. Inventory adjustments in the tool cribs and mobile tool truck will be approved by the Section Chief or Branch Chief. Records will be maintained on all inventory adjustments showing the stock number, quantity, dollar value, reason and approving authority. These records shall be maintained for a period of 5 years.

7.3.2.4.6. Variance Reports. The inventory supervisor shall prepare a tools inventory system report to be submitted to the Plant Management Division Chief. If the dollar value of the variance for a line item is $500 or more, the variance will be researched and the reason for the variance reported to the Plant Management Division Chief within 10 workdays. If the Division Chief disapproves of the reason for this variance, a report of survey shall be performed as prescribed in AFMAN 23-220, *Reports of Survey for Air Force Property.*

7.4. Tool Crib Inventory Control.

7.4.1. Crib Security. Only authorized personnel are allowed free access to the Tool Cribs. All other personnel must be escorted to gain entry.

7.4.2. Issue of Expendable and Consumable Items. Expendable and consumable items will be issued to individual tool kit owners in accordance with local directives. These items will be replaced on a one-for-one basis. Missing expendable items will require completion of a lost tool/item report before a replacement is issued.

7.4.3. Replacement Tools. Personnel with individual tool kits or consolidated kits will utilize the tool management center or satellite cribs for tool issue replacement.

7.4.4. Tool Crib Surveillance. The tool crib manager will perform monthly surveillance inspections to verify proper procedures are followed. These inspections will be documented and the documentation maintained by the manager for a period of 2 years.

7.4.5. Management of Precision Measurement Equipment (PME) in Tool Cribs. PME will be controlled in accordance with local procedures.

7.4.6. Replacement Tool Crib. Each satellite tool crib will have an area set aside for receipt/issue of replacement tools. When the master tool crib flags a replacement as ready for issue, the inventory management computer system transfers it to the appropriate satellite replacement crib. When the tool is issued and the replacement process is completed, the computer will deduct it from the replacement crib. This ensures proper maintenance of the satellite crib inventory.

7.4.7. Individual Tool Kit (ITK) Backorders (B/O). The tool and parts attendant will pull the tools from the ITK B/O listing and transfer the tool(s) to the backorder crib (a pseudo crib in the inventory management computer system). The tools will be etched for identification and sent to the appropriate satellite crib for issue. After issue, the original listing will be sent to the tool management administration office where the tools will be taken out of the backorder crib inventory and issued against the ITK via the computer system.

7.5. Kit Storage in Tool Cribs.

7.5.1. All tool kits stored in the tool cribs will be in a secure area with limited access to the tool kit keys/locks. All kits will be inventoried and entered into the inventory management computer system. A hard copy of the inventory will also be locked inside each tool kit.

7.6. Access Levels.

7.6.1. All tool crib personnel will have the same access level to perform their jobs, with the following exceptions. Access to the Tool Master File (TMF), Employee Master File (EMF) ITK Master File and Inventory Adjustments will be limited to the tool control administration office personnel and tool crib supervisors.

Chapter 8

VEHICLE CONTROL

8.1. Introduction. This chapter provides general guidance for the Vehicle Control Office (VCO) assigned to the Plant Management Division and the management of assigned vehicles by the VCO function. AFI 24-301, *Vehicle Operations* and AFPAM 24-317, *Vehicle Control*, contain further guidance on the official use of government vehicles.

8.2. Vehicle Control . The Vehicle Control Office/Officer (VCO) responsibilities include: receipting for directorate vehicles, subassigning vehicles to other TI organizations and acting as liaison between these organizations and the base transportation activity dealing with vehicle matters, obtaining transportation services required to support mission requirements, assuring proper qualification and training of vehicle operators, and providing for the maintenance, inspection and security of vehicles.

8.2.1. Vehicle Subassignments. All requests for assignment of vehicles within the product directorate are submitted to the VCO. Requests will be reviewed based on mission requirements and cost factors.

8.2.1.1. A record file containing the justification for subassignment of each vehicle will be maintained by the VCO.

8.2.2. Vehicle Operation. All supervisors with subassigned vehicles must assume full responsibility for their care and operation. Supervisors must provide adequate security for vehicles and ensure only qualified operators use them.

8.3. Vehicle Maintenance and Inspection. The VCO will conduct periodic scheduled and unscheduled inspections, as prescribed in local directives, of product directorate vehicles to ensure assigned vehicles are serviceable and clean.

8.3.1. Supervisors will ensure AF Form 1800 series, Operator's Inspection Guide and Trouble Report, are used by vehicle operators for documenting daily vehicle inspections and discrepancies. This documentation will be turned into the VCO at the end of each month. The VCO will maintain this documentation on file for 3 months. Discrepancies not corrected or recurring will be elevated to the appropriate branch chief by the VCO.

8.3.2. Scheduled Maintenance. Some maintenance actions are scheduled in advance based on miles, hours of operation or calendar time. Maintenance Control and Analysis (MCA) will coordinate scheduled maintenance with the VCO.

8.3.3. Unscheduled Maintenance. Vehicle malfunctions will be reported to vehicle maintenance customer service and the VCO within one normal workday. Malfunctions that affect safe operation of the vehicle will be reported immediately.

8.3.4. Supervisors will provide vehicle operators with instructions to follow and agencies to call when accidents occur.

8.4. Vehicle Operator Qualification and Training. The VCO will establish and manage a vehicle training program which meets the following requirements:

8.4.1. Only qualified and properly licensed military, DOD employees, or authorized DOD contractors who meet the criteria established in AFI 24-301 will operate assigned motor vehicles.

8.4.2. Each authorized vehicle operator will have an active driver history record, AF Form 2296, **Vehicle Operator Information (Part 3)**, established in the host base transportation activity's On-Line Vehicle Integrated Management System (OLVIMS) prior to operating assigned vehicles.

8.4.3. The VCO will maintain Optional Forms 345, **Physical Fitness Inquiry for Motor Vehicle Operators**, for all DOD civilian employees operating government motor vehicles that possess an AF Form 2293, **US Air Force Motor Vehicle Operator Identification Card**.

8.4.4. Supervisors in coordination with the VCO will conduct monthly vehicle safety and operator responsibility briefings and document attendance. A copy of the attendance roster will be forwarded to the VCO.

8.4.5. All personnel operating vehicles on the flightline will comply with AFOSH STD 91-100.

Chapter 9

CIVIL ENGINEER WORK REQUESTS AND SERVICE CONTRACTS

9.1. Preparation of Civil Engineering Work Requests. The Plant Management Division (TIP) is the focal point for short-range work done by Base Civil Engineering (BCE) for the product directorates. Upon determining the work required involves real property or real property installed equipment (RPIE), plant management must process the work request to BCE.

9.1.1. Requests for CE support are prepared and processed according to AFI 32-1031, *Operations Management*, AFPAM 32-1004, Vol 3, *Working in the Operations Flight Facility Maintenance* and local directives.

9.1.1.1. AF Form 332 is used when the work involves maintenance, repair, and minor construction of real property, and initial installation of RPIE. When required, appropriate drawings or sketches are submitted with the AF Form 332.

9.1.2. Requests for self-help work are subject to approval procedures and restrictions contained in AFI 32-1031.

9.1.3. On a quarterly basis, the Plant Management Division must determine the status of work requests and follow-up to ensure work is accomplished.

9.2. Preparation of Documents for Service Contracts. The Plant Management Division manages the DMAG service contract program. Responsibilities include: providing service contract program guidance to DMAG organizations; preparation, processing, and management of service contract requirements for the plant management functional area according to AFI 63-124, *Performance –Based Service Contracts*, and local procedures. Service contract budget requirements are the responsibility of each DMAG organization.

Chapter 10

PRECISION MEASUREMENT EQUIPMENT LABORATORY (PMEL)

10.1. PMEL Mission. The PMEL branch maintains, calibrates, and certifies Test, Measurement and Diagnostic Equipment (TMDE), traceable to the National Institute of Standards and Technology. It consists of a precision measurement equipment laboratory (PMEL), a quality office, production support section, and a workload planning section. The PMEL normally includes work areas such as voltage, impedance, time/frequency, microwave, temperature, mechanical/dimensional, and optics. The PMEL performs in-laboratory and on-site calibration and repair using laboratory equipment and calibration standards, a portable automatic test equipment calibrator (PATEC), a jet engine test cell/stand calibrator (JETCC), or an electrical standards set (ESS). The PMEL shall provide base-level support of aircraft, missiles, ground systems, and/or other equipment on base or in a geographic area in accordance with (IAW) AFI 21-113, *Air Force Metrology and Calibration (AFMETCAL) Program*, and TO 00-20-14, *AF Metrology and Calibration Program*.

10.2. Functions.

10.2.1. The PMEL is the single organization in the ALC authorized to perform calibrations identified in TO 33K-1-100, TMDE Calibration Internal Technical Order and Work Unit Code Reference Guide, and Calibration and Measurement Summaries (CMSs).

10.2.2. PMEL will provide repair and calibration support on all test, measurement, and diagnostic equipment and associated systems for all units on the ALC, and tenant organizations located on the ALC.

10.2.3. PMEL will provide repair and calibration support on all test, measurement and diagnostic equipment in an assigned geographical area as a Type IIA PMEL.

10.2.4. PMEL will provide the ALC with on-site repair and calibration support for TMDE that cannot be transported to the PMEL.

10.2.5. PMEL will complete all calibrations and other PMEL support in accordance with AFI 21-113, *Air Force Metrology and Calibration (AFMETCAL) Program*, TO 00-20-14, and this instruction.

10.3. Structure.

10.3.1. The ALC PMEL shall be structured within the Plant Management Division of the Technology and Industrial Directorate. A single functional area chief, the PMEL Branch Chief, is responsible for all PMEL operations to include: scheduling, planning, quality (organic/contract), and maintenance/ calibration (organic/contract). The support organization shall be organized within the PMEL as a single function.

10.3.2. The Technology and Industrial Directorate will consolidate all PMEL on-site maintenance/ calibration functions into one or more sections aligned under the PMEL functional area chief..

10.3.3. The PMEL functional area chief will identify environmentally controlled PMEL facilities used for calibration and appoint a single POC to manage the environmental records of the identified facilities.

10.4. Workload Definitions.

10.4.1. Organic Calibration Workload: Organic PMEL support on an ALC will include the following:

10.4.1.1. All on-site non-portable TMDE located on the ALC.

10.4.1.2. Peculiar TMDE in the following categories:

10.4.1.2.1. Proprietary TMDE. Documentation demonstrating the proprietary limitations imposed by the manufacturer must be in the Organic PMEL's possession.

10.4.1.2.2. One of a kind TMDE that differs significantly from common TMDE in length of calibration, difficulty of calibration or requiring special training.

10.4.1.2.3. Commercial off the shelf (COTS) TMDE no longer commercially supported that must be maintained due to its use in a production line or other direct core support. If a known commercial replacement alternative exists, this option will not be used.

10.4.1.2.4. Equipment critical to a one of a kind test stand or production line.

10.4.1.2.5. Equipment imbedded in test stands which is time prohibitive to remove for submission to the Type IIA PMEL. Analysis determining this provision must be documented.

10.4.2. Type IIA Workload. Type IIA support (usually contractor supported) on an ALC will include all off-base supported workload. Type IIA supported workload will also include all common portable TMDE. This includes all portable test equipment designated TMDE in TO 33K-1-100 and any test stand or production line TMDE that is not calibrated as a system excepting the above peculiar TMDE definition.

10.4.3. Depot structure templates (jigs, alignment fixture, and build up fixtures) shall be calibrated. If designated as PMEL responsibility by T.O. 33K-1-100-2 or applicable Calibration Measurement Summary (CMS), the PMEL shall accomplish the calibration. If designated as USER responsibility by T.O. 33K-1-100-2 or applicable CMS, the using organization shall accomplish calibration. Calibration must as a minimum be accomplished with a valid T.O. calibration or alignment procedure and be documented using T.O. 00-20-14, Section 5 procedures.

10.5. PMEL Functional Area Chief Responsibilities. The PMEL Functional Area Chief will:

10.5.1. Ensure technicians operate and maintain base-reference and working measurement standards assigned to the laboratory.

10.5.2. Ensure calibration and repair support of TMDE is completed as per TO 00-20-14 and TO 33K-1-100, or applicable CMS for the host, tenant, and off-base supported activities.

10.5.3. Ensure all provisions of AFOSH STD 91-90 are applied.

10.5.4. Establish and maintain a priority maintenance support plan for mission essential TMDE. As a minimum, the plan must ensure PMEL personnel are readily available to support essential maintenance requirements.

10.5.5. Develop and implement a customer-relations program to provide technical assistance and to obtain customer-service feedback on TMDE matters.

10.5.5.1. The customer relations program will include periodic visits to, telecommunications contact with, or locally developed customer survey letters sent to, all on- and off-base owning work center (OWC) customers.

10.5.5.2. All customers will be contacted yearly and records documenting these visits, contacts, or surveys, will be maintained for historical purposes.

10.5.6. Establish a program to control and issue K stamps.

10.5.6.1. The branch chief may delegate, in writing, this authority to the quality office.

10.5.7. Ensure a training plan, to include OJT and classroom training, is developed and documented.

10.5.7.1. The training plan will address OJT outlines for the various PMEL measurement disciplines and advanced training requirements.

10.5.8. Use this instruction, AFI 21-113, TO 00-20-14, TO 33K-1-100, CMSs, and AFMAN 32-1094, *Criteria for Air Force Precision Measurement Equipment Laboratory Design and Construction*, to maintain PMEL certification.

10.5.9. Establish a total quality program (TQP) IAW paragraph 10.6 below.

10.5.10. The PMEL functional area chief shall report discrepancies to HQ AFMC/DOM within 48 hours when such discrepancies involve standards, facilities, or environment that impact the production designated workload and are expected to remain for more than 2 weeks. Report impacts to the following workloads at a minimum: (1) Gageblock calibration; (2) Liquid Flow calibration; (3) 68 degrees room Type IIA workload; (4) Acoustic workload; (5) Fiber Optics workload; (6) Any other critical workload.

10.5.11. Prepare PMEL report control symbol (RCS) (HAF-LG (SA) 7808) IAW TO 00-20-14 and MAJCOM instructions. Provide a copy to the command functional area manager at HQ AFMC/DOM.

10.5.12. Ensure PMEL management responsibilities outlined in TO 00-20-14, Section 3 are fulfilled.

10.5.13. Establish a TO file to meet calibration and repair requirements.

10.5.13.1. Ensure maintenance and repair are not accomplished without the appropriate maintenance TO or other approved maintenance data and that this data is current and complete.

10.5.14. Ensure a system is established to review equipment in deferred status's.

10.5.14.1. Reviews must be accomplished, at a minimum, by the first duty day of each month.

10.5.14.2. Retain documentation of reviews until TMDE is completed and returned to the OWC.

10.5.15. Ensure a system is established to contact owners of TMDE before NRTS action or limitation to certification action is taken. This does not apply to TO directed limitations.

10.5.15.1. Document in the PMEL Maintenance Information System (MIS) or manual file, at a minimum, the date/time and name of the owner/user contacted.

10.5.15.2. Retain contact documentation for a minimum of six months.

10.5.16. Establish a preventive maintenance program to track inspection requirements for laboratory-owned equipment. Use AFTO Form 244/245, **Industrial/Support Equipment Record**, or computer generated equivalent to document preventive maintenance actions and requirements.

10.5.16.1. This program must include recurring events such as safety inspections, etc.

10.6. PMEL Total Quality Program (TQP). The TQP is established by the TMDE functional area chief. The PMEL TQP outlined in TO 00-20-14, Section 9, and this chapter will be used to implement the program. The quality office shall be functionally and administratively aligned under the PMEL branch chief. Quality process evaluators (QPEs) shall not be matrixed from other organizations.

10.6.1. Organic PMEL Section. The PMEL functional area chief will:

10.6.1.1. Appoint highly qualified personnel with significant metrology experience as quality process evaluators (QPE).

10.6.1.2. QPEs will:

10.6.1.2.1. Publish a monthly TQP summary report and route it through ALC/TIP supervision at a minimum. Local instructions will be developed to define the requirements IAW TO 00-20-14, Section 9. Forward this report to HQ AFMC/DOM upon request.

10.6.1.2.2. Perform technical evaluations and reviews of PMEL production processes, products, and services to assess equipment condition, process compliance, calibration traceability, personnel proficiency, quality of training; and inform the TMDE functional area chief of findings.

10.6.1.2.3. Give on-the-spot follow-up assistance and remedial instruction if required in correcting nonconformity.

10.6.1.2.4. Participate in nonconformity evaluations to find root cause(s).

10.6.1.2.5. Log nonconformity, root causes, and corrective actions in a computer database.

10.6.1.2.6. Review and track technical order (TO) improvement reports and deficiency reports (DR) for compliance with TO 00-5-1, *USAF Technical Order System*, and TO 00-35D-54, *USAF Material Deficiency Report and Investigation System*, respectively.

10.6.1.2.7. Verify requests for calibration responsibility determinations (AFTO Form 45, **Request for Calibration Responsibility Determination**) and maintain a suspense file until changes are incorporated into work unit code (WUC) manuals.

10.6.2. Type IIA PMEL. The Type IIA PMEL laboratory chief will:

10.6.2.1. Appoint highly qualified personnel with significant metrology experience as quality process evaluators (QPE).

10.6.2.2. QPEs will:

10.6.2.2.1. Publish a monthly TQP summary report and route it through the PMEL FAC at a minimum. Local instructions will be developed to define the requirements IAW TO 00-20-14, Section 9.

10.6.2.2.2. Perform technical evaluations and reviews of PMEL production processes, products, and services to assess equipment condition, process compliance, calibration traceability, personnel proficiency, quality of training; and inform the Type IIA PMEL laboratory chief of findings.

10.6.2.2.3. Evaluate nonconformity and problem areas to find root cause(s).

10.6.2.2.4. Log nonconformity, root causes, and corrective actions in PMEL Maintenance Information System (MIS).

10.6.2.2.5. Review and track technical order (TO) improvement reports and deficiency reports (DR) for compliance with TO 00-5-1, and TO 00-35D-54.

10.6.2.2.6. Verify requests for calibration responsibility determinations on AFTO Form 45 and maintain a suspense file until changes are incorporated into work unit code (WUC) manuals.

10.7. Production Support Section. The production control section consists of planning, scheduling, and materiel control functions. Production control section will use PMEL MIS to maintain an accurate master identification listing, process equipment, and provide current status of all TMDE.

10.7.1. Planning function will:

10.7.1.1. Establish local procedures for turn-in and pick up and delivery of TMDE.

10.7.1.2. Ensure emergency and mission essential equipment can be accepted at any time.

10.7.1.3. Inspect each item of incoming TMDE to determine exterior condition and, for unscheduled TMDE malfunctions, adequacy of discrepancy documentation.

10.7.1.4. Produce monthly TMDE schedules and quarterly master identification lists not later than five workdays before the first day of the month and distribute it to the owning work centers (OWCs) for correction and verification.

10.7.1.5. Establish and document procedures to ensure PMEL MIS database errors are corrected.

10.7.1.6. Notify customers to remove overdue TMDE from service unless a calibration extension was previously authorized IAW TO 00-20-14.

10.7.1.6.1. The PMEL may delete over-due TMDE from the MIS after 60 days not released by user (NRBU)/over-due status.

10.7.1.7. Provide training to on-base OWC TMDE monitors. Maintain a database or log of coordinator training (dates, names, organizations, etc.).

10.7.1.7.1. Provide a TMDE monitor training handbook to off-base TMDE coordinators.

10.7.2. Production scheduling function will:

10.7.2.1. Advise the functional area chief of significant increases in workload or deviations from the schedule.

10.7.2.2. Establish a hold area for deferred TMDE.

10.7.2.2.1. Notify OWCs of the change to a deferred status.

10.7.2.2.2. Return items awaiting technical data or accessories from the OWC, after a reasonable period. Notify customer before taking action to return item. Log customer contact information in the PMEL MIS.

10.7.2.3. Establish an awaiting shipment area for TMDE sent to another support activity or to an OWC and maintain a database or file with associated documents.

10.7.2.4. Maintain source documents for all incoming and outgoing shipments.

10.7.2.5. Mail or electronically transmit advance and receipt notices to TMDE destination and origination organizations respectively.

10.7.2.5.1. Perform written or electronic follow-up when the addressee has not acknowledged receipt of TMDE within 30 days of the shipping date.

10.7.2.6. Ensure the current status of all TMDE processed into the PMEL for repair/calibration is reflected in the PMEL MIS database.

10.7.2.7. Schedule TMDE based on category and first-in, first-out within each category. A minimum of the following TMDE calibration or repair categories will apply:

10.7.2.7.1. Emergency - One-of-a-kind TMDE that is inoperable or due calibration and for which a critical job is at a work stoppage. A letter of justification signed by the OWC flight chief (or equivalent) will accompany the equipment. The letter may be handwritten to prevent delay, and telephone verification between the OWC and PMEL is encouraged. PMEL must accept emergency equipment any time and immediately place it into work with calibration or repair action continuous until repair or calibration is completed or status of the item changes (i.e., awaiting parts (AWP), deferred for lack of standards or technical data, etc.). The TMDE flight or section chief should require an OWC technician familiar with the equipment to accompany the equipment to and remain at the PMEL to provide technical assistance until the equipment is completed or placed in an interim complete status. The owning/using organization will pick up the items immediately upon notification of completion.

10.7.2.7.2. Priority - One-of-a-kind or one-deep TMDE that is part of a unit's deployment package or is critical to daily peacetime operations, and any TMDE for which a critical quantity has become unavailable for use. A letter of justification signed by the OWC flight chief (or equivalent) will accompany the equipment. The OWC flight chief (or equivalent) should pre-identify by letter TMDE that meets the mission essential definition as approved by the TMDE flight chief or delegated approval authority. PMEL must accept mission essential equipment any time during duty hours and schedule it as the next item into work with the equipment worked by all shifts until calibration or repair is completed or status of the item changes. The owning/using organization will pick up the item immediately upon notification of completion.

10.7.2.7.3. Routine - TMDE not categorized as emergency or mission essential. PMEL must accept routine equipment during normal turn-in/pick up hours.

10.7.2.7.4. The PMEL functional area chief may add other priority categories if needed.

10.7.3. Monitor and control AWP TMDE using supply generated and internally generated reports.

10.7.3.1. Store parts received for AWP items with the end item.

10.7.3.2. Attach a copy of source document of outstanding requisitions with AWP TMDE.

10.7.3.3. Transfer all items from AWP to In Progress (INPRG) when all parts are received.

10.7.3.4. Ensure that supply requisition priorities are commensurate with mission requirements.

10.7.3.5. Monitor due-in from maintenance (DIFM) listings and assets to ensure control and timely processing.

THOMAS W. BATTERMAN, SES
Deputy Director for Depot Maintenance, Director of Logistics

Attachment 1

GLOSSARY OF TERMS

Terms

Bill of Material (BOM)—Source document for material required for a project.

Consumables—Items used in conjunction with tooling/equipment, yet after limited usage do not maintain their original configuration and are considered used up. Examples are safety wire, solder, tape, sanding disk, string, chalk, etc.

Expendables—Items that become unfit for use and must be replaced periodically. Examples include blades, drill bits, reamers and apexes.

Industrial Plant Equipment (IPE)—Plant equipment with a unit acquisition cost of $15,000 or more. IPE would include equipment items used for cutting, abrading, grinding, shaping, forming, joining, heating, treating, or otherwise altering the physical properties of materials, components or end items entailed in manufacturing, maintenance, supply, processing, assembly, or research and development operations.

Real Property—Any government owned, leased, or controlled property used to fulfill government research, development, test, evaluation, production, maintenance or modification, or for the storage of supporting production machinery and equipment. Includes land, buildings, structures, utility systems, and improvements. Also includes equipment attached to and part of buildings and structures (such as heating systems) but not movable equipment (such as plant equipment).

Support Equipment—Items used to aid in performing tasks. Examples are drop lights, extension cords, multiple air hose couplings, air hoses, etc.

Test, Measurement, and Diagnostic Equipment (TMDE)—Devices used to test, measure, calibrate, evaluate, inspect, or otherwise examine materials, supplies, equipment and systems to identify or isolate any actual or potential malfunctions.

Tool Kit Custodial Receipt Listing (TKCRL)—An inventory of all tools and other items in a tool kit. Includes the quantities, the kit ID number and the tool and item location, i.e. drawer or shelf. The original copy of the TKCRL generated by the Tool Management Center (TMC) is the Master TKCRL. This Master TKCRL lists all tools for which the TMC will hold employees responsible, in addition to any tools added to the tool kit.

Tool Kit—A container used to store tools or equipment and to maintain positive control and ease of inventory. This grouping of tools is used for a specific task, skill, work area, weapon system, or combination thereof. An individual or a group may use the kit.

Tool Management Center (Tool Crib)—The focal point for the procurement, issuance, and management of common hand tools, power tools, and TMDE hand tools purchased for accomplishing the ALC workload.